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SHORTER ARTICLES AND DISCUSSION

NOTE ON THE COLORATION OF *PLANES MINUTUS*¹

It is well known that the coloration of the grapsoid crab *Planes minutus*, a constant member of the Sargassum fauna, is "homochromic" to a high degree, not only as to tint and mottling, but also in the frequent occurrence of a blotch of pale yellowish or blank white upon the carapace; this has generally been supposed to be a mimicking of the white patches of encrusting bryozoa and *Spirorbis* tubes, which commonly infest the Sargassum.² Experiments made to discover the extent of possible color changes in the adult *Planes* when it is placed over variously pigmented artificial bottoms have led to no result, other than to show—conformably with what is known for some other crustacea possessing a dense body pigmentation, as contrasted with a relatively scanty supply of well-scattered chromatophores—that the power of color adaptation is decidedly limited. It is, therefore, of interest to make record of an instance in which pronounced color adaptation of *Planes* had occurred in nature.

In January, 1916, after a rather severe gale, there was found stranded upon one of the reef "heads" at Bermuda a large "Spanish cedar" tree. It is certain that the tree had been in the sea for some time, as the surface layer was thickly populated by *Teredo* and boring amphipods. The trunk, the stumps of the roots and the submerged branches of the tree were covered with a forest of barnacles, *Lepas anatifera*, from among whose smoky-brown erectile peduncles were obtained a vast number of adult *Planes minutus* that were adhering to the more or less honey-combed parts of the exposed bark and wood. Without exception the crabs were deep brownish-red, save for the frequently occurring dorsal white patch. This pigmentation harmonized precisely in general tint with the mahogany-colored surface of the cedar tree.

The interest of this case lies in its demonstration that these crabs—prominent members of that specialized gulf-weed fauna which has been urged as part of an argument for the antiquity

¹ Contributions from the Bermuda Biological Station for Research, No. 84.

² Cf. Verrill, 1908, Pl. XIII; Murray and Hjort, 1912, p. 671, Pl. VI.

of the floating beds of Sargassum (Collins, 1917), probably for generations experiencing no other habitat than the gulf-weed—having yet retained a considerable capacity of color adaptation. Among Sargassum the hues of *Planes* vary considerably,³ but the color of the present specimens was very much darker and redder than that of any I have seen described. The color agreement could hardly have resulted from a general staining of the crabs following ingestion of pigment derived from the tree, as the characteristic white blotch upon the dorsum was fully as well, if not somewhat more, developed in many of these specimens, than in the common ones living upon gulf-weed. Spectroscopic examination of alcoholic extracts of these crabs showed that the pigment was not detectably different from that of *Planes* taken on Sargassum. Whether the white patch represents in this instance an inherited tendency to lack of pigment on that area, or is rather to be regarded as (in addition) a mimicking of the white valves of the accompanying Lepads, is a question; the conspicuous development of the white shield, its large size and precise outline in more than 50 per cent. of the individuals, suggests the possibility of the latter alternative.

Presumably the floating cedar tree was invaded by *Planes* larvæ, which developed upon this dark reddish-brown substratum, and, like Hippolyte in the experiments of Gamble and Keeble (1900), produced there a pigmentation of corresponding appearance. In this way a coloration might be acquired which the crabs probably could not, at least quickly, have accomplished by adaptive color change in the adult state. No color changes were detected when these dark crabs were kept for six days upon Sargassum, in bright light.

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³ Cf. Murray and Hjort, 1912, Pl. VI.